

WHAT IS CLAIMED IS:

1. An image recording method employing a recording sheet having a coloring layer made of an electrochromic material and an electrolytic layer with an increased electrical conductivity in a specific temperature range, characterized by including moving a recording head with a plurality of heating elements arranged in a linear direction relative to the surface of said recording sheet in the direction orthogonal to said linear direction while at the same time applying a voltage to the front and back faces of said recording sheet, and causing a coloring reaction only in a part where heat is applied by said heating elements to form an image on said recording sheet.

2. An image recording method employing a recording sheet having a coloring layer made of an electrochromic material, characterized by including moving a recording head with a plurality of independently driven electrodes arranged in a linear direction relative to the surface of said recording sheet in the direction orthogonal to said linear direction, and causing a coloring reaction only in a part where voltage is applied by said independently driven electrodes to form an image on said recording sheet.

3. The image recording method according to claim 1 or 2, characterized in that said recording sheet is a laminated recording sheet in which a plurality of recording sheets coloring

in different colors are laminated in multiple stages, in which an image is formed by applying selectively a voltage to a recording sheet of each color.

5           4.    The image recording method according to claim 1, characterized in that said recording sheet is a multi-color recording sheet having a plurality of coloring cells dispersed within a coloring layer, said plurality of coloring cells coloring in different colors in accordance with an applied voltage, and  
10   a plurality of electrolyte cells dispersed within an electrolytic layer corresponding to the coloring species of said coloring cells, the electrolyte cells of each of the coloring species having an increased electrical conductivity in a different temperature range, wherein an image is formed by heating  
15   selectively said electrolyte cells in a predetermined temperature range in accordance with the coloring species, while applying a predetermined voltage to said multi-color recording sheet in accordance with the coloring species.

20           5.    An image recording apparatus comprising:  
a fixed planar electrode for laying thereon a recording sheet having a coloring layer made of an electrochromic material and an electrolytic layer with an increased electrical conductivity in a specific temperature range;

25           a recording head having a movable strip-shaped electrode in contact with an upper face of said recording sheet, a sliding

10026762-122701

electrode for sliding with said fixed planar electrode, and a plurality of heating elements for applying heat via said movable strip-shaped electrode to said recording sheet, said plurality of heating elements being arranged linearly, said recording head heating selectively said heating elements while applying a voltage between said strip movable electrode and said sliding electrode; and

movement means for moving said recording head relative to said planar support along the direction orthogonal to a direction where said heating elements are arranged.

6. An image recording apparatus comprising:

a fixed planar electrode for laying thereon a recording sheet having a coloring layer made of an electrochromic material;

a recording head having a plurality of independent driving electrodes arranged linearly, and a sliding electrode for sliding with said fixed planar electrode, said recording head selectively applying a voltage between said independent driving electrodes and said sliding electrode; and

movement means for moving said recording head relative to said planar support along the direction orthogonal to a direction where said independent driving electrodes are arranged.

7. The image recording apparatus according to claim 5 or 6, characterized in that said fixed planar electrode is formed to be larger than said recording sheet, and said sliding electrode

is disposed in said recording head to slide with an exposed portion of said fixed planar electrode extending out of said recording sheet.

5        8.    The image recording apparatus according to claim 7, characterized in that said recording head has said sliding electrode disposed at an end portion in the direction where said heating elements or said independent driving electrodes are arranged.

10        9.    The image recording apparatus according to claim 5 or claim 6, characterized in that a multi-layer recording sheet consists of a plurality of recording sheets coloring in different colors that are laminated in multiple stages and transparent electrodes interposed between the recording sheets to be exposed  
15        at the sheet end portion, and a plurality of sliding electrode are provided on the side of the recording head to slide with said transparent electrodes interposed.

20        10.   The image recording method according to claim 5 or claim 6, characterized in that said recording sheet is a multi-color recording sheet having a plurality of coloring cells dispersed within a coloring layer, said plurality of coloring cells coloring  
25        in different colors in accordance with an applied voltage, and a plurality of electrolyte cells dispersed within an electrolytic layer corresponding to the coloring species of said coloring

10026762-122701

cells, the electrolyte cells of each coloring species having an increasing electrical conductivity in a different temperature range.

5        11. A multi-color recording sheet characterized by having a coloring layer made of an electrochromic material, and comprising an electrolytic layer provided in contact with said coloring layer and made of an electrolyte with an increasing electrical conductivity in a specific temperature range.

10        12. A multi-color recording sheet characterized in that a plurality of recording sheets made of an electrochromic material and coloring in different colors are laminated in multiple stages, and the transparent electrodes are interposed between the recording  
15 sheets to be exposed at the end portion of layer.

20        13. The multi-color recording sheet according to claim 11, characterized in that a plurality of recording sheets coloring in different colors are laminated in multiple stages, and the transparent electrodes are interposed between the recording sheets to be exposed at the sheet end portion.

25        14. The multi-color recording sheet according to claim 11, characterized in that said coloring layer has a plurality of coloring cells coloring in different colors in accordance with an applied voltage dispersed therein, and said electrolytic

layer has a plurality of electrolyte cells with an increasing electrical conductivity in a different temperature range dispersed corresponding to the coloring species of said coloring cells.

5

10026762.122701